

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

**Ex parte** WIESLAW J. ROTH, BRIAN J. RATIGAN, PAT & T.M OFFICE  
and DOMINICK N. MAZZONE BOARD OF PATENT APPEALS  
AND INTERFERENCES

MAILED

JUL 28 2005

Appeal No. 2005-1070  
Application No. 09/305,019

ON BRIEF

Before OWENS, WALTZ, and PAWLIKOWSKI, **Administrative Patent Judges**.  
**WALTZ, Administrative Patent Judge.**

**DECISION ON APPEAL**

This is a decision on an appeal from the primary examiner's final rejection of claims 4 through 12, which are the only claims pending in this application. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to an alkylation/transalkylation process for preparing a monoalkylated compound from an alkylatable aromatic compound and an alkylating agent, where the small crystal size of the TEA-mordenite

transalkylation catalyst has been found to have unexpectedly high activity in the liquid phase (Brief, page 2). Representative independent claim 4 is reproduced below:

4. A process for producing a monoalkylated aromatic compound comprising the steps of:

(a) contacting an alkylatable aromatic compound with an alkylating agent in the presence of an alkylation catalyst in an alkylation reaction [sic, reactor] to provide a product comprising said monoalkylated aromatic compound and a polyalkylated aromatic compound and then

(b) contacting the polyalkylated aromatic compound from step (a) with said alkylatable aromatic compound in the liquid phase and in the presence of a transalkylation catalyst in a transalkylation reactor separate from said alkylation reactor, said transalkylation catalyst comprising TEA-mordenite having an average crystal size of less than 0.5 micron to produce said monoalkylated aromatic compound.

The examiner relies on the following references as evidence of obviousness:

Chu	3,766,093	Oct. 16, 1973
Innes et al. (Innes)	4,891,458	Jan. 02, 1990
Cheng et al. (Cheng)	5,557,024	Sep. 17, 1996
Kuchenmeister et al. (EP '608) 0 733 608 A1		Sep. 25, 1996

(published European Patent Application)

Claims 4-9 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cheng in view of EP '608 (Answer, page 3). Claim 10 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Cheng in view of EP '608 and Innes (Answer, page 4). Claims 11 and 12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cheng in view of EP '608 and Chu (Answer, page 5).

Based on the totality of the record, including due consideration of the opposing arguments set forth in the Brief, Reply Brief and the Answer, we reverse all rejections on appeal essentially for the reasons stated in the Brief, Reply Brief, and those reasons set forth below.

#### OPINION

##### A. *The Rejection of Claims 4 through 9*

The examiner finds that Cheng discloses all of the limitations required by claim 4 on appeal except that Cheng is silent as to the average crystal size of the transalkylation catalyst, while claim 4 on appeal requires that the TEA-mordenite catalyst has an average crystal size of less than 0.5 micron (Answer, page 4).

Optimization of a parameter which was not recognized in the prior art as a result-effective variable is generally not *prima facie* obvious. *See In re Antonie*, 559 F.2d 618, 620, 195 USPQ 6, 8-9 (CCPA 1977); *see also In re Sebek*, 465 F.2d 904, 907, 175 USPQ 93,

95 (CCPA 1972). However, the examiner further finds that EP '608 discloses a transalkylation process for polyalkylbenzenes produced during the alkylation of benzene with olefins, where the crystalline aluminosilicate catalyst produces advantageous results due to the average crystal size of the catalyst being less than about 0.5 micron (Answer, page 3). From these findings, the examiner concludes that it would have been obvious to one of ordinary skill in this art at the time of appellants' invention to use a TEA-mordenite catalyst having an average crystal particle size of less than 0.5 micron in the process of Cheng, as taught by EP '608 to improve transalkylation control (Answer, page 4).<sup>1</sup>

As correctly argued by appellants (Brief, page 7; Reply Brief, pages 2-3), the examiner's rejection is premised on the erroneous assumption that the teaching of crystal particle size in EP '608, directed to an aluminosilicate catalyst used in vapor phase transalkylation processes, would have been applicable to the liquid phase transalkylation process of Cheng. However, the examiner, on this record, has not met the initial burden of proof in establishing why one of ordinary skill in this art would have applied the teaching of EP '608 regarding catalyst particle size,

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<sup>1</sup>We note that this rejection was first made as a new ground of rejection in the decision in Appeal No. 2001-2453 (App. No. 09/305,019, Paper No. 23, pages 5-6).

used in a vapor phase transalkylation process, to a liquid phase transalkylation process operating at much lower temperatures and pressures. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Additionally, as also argued by appellants (Brief, page 8), EP '608 teaches that the catalyst used in their invention "may contain up to about 40% orthorombic [sic, orthorhombic] crystalline structure" (page 3, 20-22). The examiner does not dispute that TEA-mordenite has a wholly orthorhombic crystalline structure (Brief, page 8; see the Answer in its entirety). Therefore TEA-mordenite would not be a catalyst within the scope of the transalkylation catalysts taught by EP '608. Accordingly, the examiner has not established why one of ordinary skill in this art would have employed the teachings of EP '608 regarding catalyst crystal size to the TEA-mordenite catalyst in the process of Cheng.

For the foregoing reasons, we determine that the examiner has not established a *prima facie* case of obviousness in view of the reference evidence. Accordingly, we need not reach the issue of the sufficiency of the showing of unexpected results (see the two Declarations under 37 CFR § 1.132 by Dr. Roth). See *In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Therefore

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the rejection of claims 4-9 under section 103(a) over Cheng in view of EP '608 is reversed.

*B. The Rejections of Claims 10, 11 and 12*

The examiner rejects claim 10 over the references discussed above with regard to claim 4, further citing Innes for teachings regarding the transalkylation operating pressure and weight ratio of benzene to polyalkylated benzene (Answer, page 4). With regard to the rejection of claims 11 and 12, the examiner additionally cites Chu to show the process of preparing TEA-mordenite, including the useful ratios of silica to alumina (Answer, page 5). Therefore we determine that the Innes and Chu references do not cure the deficiencies in the base rejection of claims 4-9 as discussed above. Accordingly, we cannot sustain these rejections for the reasons noted above.

*C. Summary*

The rejection of claims 4-9 under 35 U.S.C. § 103(a) over Cheng in view of EP '608 is reversed. The rejection of claim 10 under 35 U.S.C. § 103(a) over Cheng in view of EP '608 and Innes is

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reversed. The rejection of claims 11 and 12 under 35 U.S.C. § 103(a) over Cheng in view of EP '608 and Chu is reversed.

The decision of the examiner is reversed.

**REVERSED**

*Terry J. Owens*  
TERRY J. OWENS )  
Administrative Patent Judge )  
 )  
*Thomas A. Waltz*  
THOMAS A. WALTZ ) BOARD OF PATENT  
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